LIQUID CONFLICT IN 21ST CENTURY SOUTH ASIA: EXPLORING HYDROPOLITICAL TENSIONS BETWEEN INDIA AND PAKISTAN

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A research study submitted to Johns Hopkins University in conformity with the requirements for the degree of Master of Arts in Global Security Studies

Baltimore, Maryland
May, 2021

Abstract

As climate change continues to alter the physical world, transboundary sources of fresh water are experiencing increasing stress. Among the shared rivers of the world, the Indus river system of South Asia poses a unique security threat due to its role in the contentious India-Pakistan relationship. The mix of population growth and climate change-related water stresses both states experience provide solid ground to pursue a renegotiation or updating of their shared 1960 Indus Waters Treaty; but achieving such a diplomatic breakthrough remains elusive. Left unaddressed, the tensions connected to the Indus system raises the specter of a future Indo-Pak conflict catalyzing into a nuclear exchange that would devastate the region far beyond the borders of the principal actors themselves. In an effort to mitigate the risk of such a conflict, there is great value in investigating what possible conditions might produce a successful future negotiation over the Indus Waters Treaty. To begin identifying which conditions or provisions might be present in today's Indo-Pak relationship (if any), this inquiry will attempt to answer the following research question: *What baseline conditions are needed in the 21st century to facilitate a possible renegotiation or updating of the 1960 Indus Waters Treaty between India and Pakistan?*

To answer this research question, I have applied discourse and content analysis techniques to a balanced sample of water-related policy documents from India and Pakistan that span the last twenty years; 20 documents per state. I conducted successive rounds of open and axial coding of these documents in accordance with a Grounded Theory approach to this qualitative study, yielding part of a theoretical framework for successful riparian negotiations. My findings indicate that several critical baseline conditions for success do indeed exist between

India and Pakistan. Both governments share an understanding of what fresh water means to each state, they employ similarly high-level officials to communicate water policy, and they are both acting from a position of rationality, in the neorealist sense of the word. While far from a complete solution, this illustration of specific areas of commonality between rival states should be cause for hope. Building on the ideas of this research would eventually lead to a greater chance of success in a bilateral updating the Indus Waters Treaty than might otherwise be assumed.

Research Study Reviewers:

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Beyond the role water plays in sustaining our day-to-day lives, this precious resource also exerts significant influence on all levels of human society. When competing demands for fresh water inevitably arise between different sectors of society, security practitioners and government policymakers would be wise to remember that disputes over water are driven by local environmental realities that defy political or territorial borders. Quite often, this discrepancy between natural resources and human-selected territory contributes to strained relations among water-sharing or *riparian* states. While food and energy sources can vary, water is the only resource for which there is no substitute. Consequently, freshwater lakes, rivers, and aquifers shared by two or more states will necessarily cause these stakeholders to interact with one another. When they engage over a transboundary water source, these interactions can catalyze mutually beneficial acts of collaboration. But they can also lead to a zero-sum competition for the water in question. It is the sense of competition, the impression that one more liter for *Them* means one less liter for *Us*, that lends itself to water disputes.

There are many transboundary water sources around the world that illustrate the connection between water and security, each with unique hydropolitical variables to explore. The United States and Canada have their Great Lakes. South America's most famous example is, of course, the Amazon. The Nile River is shared by multiple states in Africa, as is the Rhine River in Europe. But among these and other riparian relationships, the rivers of South Asian pose a distinctly complex and urgent challenge to any pursuit of stability and/or prosperity.

1.1 South Asia's Hydropolitical Environment

Among the security risks facing 21st century South Asia, the region's freshwater profile deserves ongoing attention for two primary reasons. First, as previously mentioned, there is no substitute for fresh water. Second, one particular river system in South Asia, the Indus, is contentiously shared by long-time enemies India and Pakistan. As these states are connected by their shared waters, they have no choice but to interact; each time exposing the citizens of the entire region to the risk of an Indo-Pak conflict. Whenever that risk occurs, it invariably raises the specter of nuclear annihilation each successive interaction. Much like religious disagreements and historical grievances, water must be considered a security issue between India and Pakistan. Addressing the contentious use of the Indus river system is a crucial component of any attempt to forge a lasting peace between these riparian states.

The extensive body of traditional Indo-Pak security literature focuses on the risk of war, counterinsurgency, and nuclear nonproliferation, but there are other questions to consider as well. If conventional or nuclear war is the problem we hope to avoid, what do we need to know about India and/or about Pakistan in order to proactively diffuse sources of tension before they lead to any escalation? We would surely need to know the contexts of the people living in both states: their history, religion, culture, politics, etc. Additionally, we must recall that the study of conflicting peoples' physical environments is just as important as examining shared history. If the practitioner community could generate a sufficiently rich body of literature concerning transboundary water and security, policymakers in riparian states could draw on this knowledge to craft policy solutions for unresolved, water-related stress between them and their neighbors. With the above-listed ideas in mind, the purpose of this inquiry is to contribute to a more stable

Indo-Pacific security environment by exploring freshwater's influence on 21st century India-Pakistan relations.

This paper explores India and Pakistan's hydropolitical challenges by analyzing the water-related policies of both state governments. The choice of India and Pakistan stems partially from academic interest, but more importantly, as a security practitioner I am aware of the hazards of mixing historical and contemporary hostility with nuclear weapons stockpiles. Where India and Pakistan are concerned, this toxic mix must not be allowed to fester further, lest it metastasize into a conflict with a catastrophically high body count. The central process I investigated was the ongoing cycle of diplomatic and political interactions between India and Pakistan. By employing the mixed-method software platform Dedoose, I conducted thorough discourse and content analyses of speech transcripts, legal documents, policy memos, and legislative documents that pertained to the shared Indus river system. After open coding these documents to identify major themes, I identified several topics to focus on through the process of axial coding. Eventually, I applied a selective coding process and formed an operational theory at the intersections of those aforementioned themes. My ultimate goal in this research was to address the question: *What baseline conditions are needed in the 21st century to facilitate a possible renegotiation or updating of the 1960 Indus Waters Treaty between India and Pakistan?*

1.2 Thesis Overview

The format of this essay is as follows: First, I introduce the topic of my inquiry and describe its importance to the broader field of security studies. Next, I provide a survey of 21st century scholarly literature discussing transboundary water as a security concern. I combine this

literature review with a brief examination of the history of India-Pakistan relations that includes an introduction to their water-sharing agreement, the 1960 Indus Waters Treaty (IWT). With this context established, I move on to explain the selection criteria for my data sample, my methodological approach, and the analytical techniques to be applied to my data. I create and apply a set of descriptive codes to my primary data in Dedoose, present my key findings, and discuss their implications for India-Pakistan relations. I continue the discussion by situating my findings in the context of the broader study of transboundary water security, address the limitations in my research design, and conclude by exploring issues left unaddressed that may be resolved in a future inquiry.

2. Literature Review: Tracing the Evolution of Water Security

Successfully resolving any security issue requires studying the challenge in question from as many different angles as possible. Before exploring the hydropolitical links between India and Pakistan specifically, it is incumbent on the researcher to survey the wider field of transboundary water security discourse. Searching for answers to nascent disputes over fresh water is a timeless yet urgent concern, and every effort should be made to understand how all riparian relationships are affected by sharing this most vital resource to human civilization.

It is also important to provide an early, working definition of this slightly amorphous term, "water security," to prevent confusion later in the research process. We must also remember that the conception of water security, like terrorism and war, will vary depending on which transboundary water source we examine. A 2012 article by Christina Cook and Karen Bakker, "Water Security: Debating an Emerging Paradigm," offers a useful starting point by

laying out four recurring themes from their expansive review of collected works. Defining this term *water security* should reflect each of the following themes:

1. The quantity of exploitable water available and demand relative to it.
2. Human vulnerability to water from natural hazards like droughts or flooding, non-natural hazards like pollution, and/or deliberate contamination via an act of bioterrorism.
3. The variety of human needs for water, going far beyond drinking water to encompass food security (crops and livestock), energy production, hygiene and health, development projects, and even luxury goods.
4. The topic of sustainability; providing access to affordable, clean water that can satisfy current demand while also safeguarding resources for future generations.[1]

It is also necessary here to adopt a framework that quantifies the amount of water needed to meet each of the demands implicit in the four themes listed above. Water security is not an absolute concept, so our framework should be able to indicate varying degrees of security or lack thereof. Cook, Bakker, and many other scholars employ an assessment tool well-known to water studies known as Falkenmark's *Water Stress Index* (WSI). The WSI quantifies water availability per capita in a given state versus the various demands on that state's water resources. A state with a WSI value of 1,700 cubic meters or more per capita it is considered *water sufficient*, whereas a WSI score between 1,000 and 1,700 cubic meters per capita indicates a state is *water* stressed. Below 1,000 cubic meters per capita, a state is considered *water scarce*, and below 500 cubic

[1]Cook, Christina and Bakker, Karen. "Water Security: Debating an Emerging Paradigm." *Global Environmental Change* 22, no. 1 (2012): 97.

meters a state faces *absolute water scarcity.*[2] While these WSI numbers only indicate quantity and not the quality of water, Falkenmark's system is a useful framework for evaluating water security in a manner accessible to readers beyond the security studies field. For a sense of scale, one cubic meter of water is equal to 1,000 liters or approximately 264 gallons.[3]

To further refine my working definition so as to encompass more than just the quantity of water available, I have adopted a definition from 2007 that effectively simplifies this rather complex concept. In "Sink or swim? Water security for growth and development," David Grey and Claudia Sadoff define water security as, "…the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies."[4] This framing helps us properly evaluate water security literature by clearly delineating specific levels of water stress or scarcity.

Typically, the field of security studies concerns itself with war, terrorism, and state-to-state competition. But a growing number of scholars point to environmental degradation linked to climate change as a risk factor and force-multiplier in conflicts between and within states. Though the water security discipline itself is still taking shape, the abundance of climatic data available to practitioners today offers a rich avenue through which to explore perpetual security problems. Earlier scholarship matters, but this essay will be constrained in scope to the 21st century due to the recent explosion of data on this topic and the increasingly visible ways climate change is altering our freshwater resources.

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[2]Cook and Bakker, *Water Security*, 179-180.

[3] *Volume Converter*, 2021, https://converter.net/volume/1-cubic-meters-to-gallons

[4]Grey, David and Sadoff, Claudia W. "Sink or Swim? Water Security for Growth and Development." *Water Policy* 9, no. 6 (2007): 546-547.

2.1 Diverging Conceptions of Water in Security Discourse

The security literature of the last two decades can largely be grouped into one of two schools of thought regarding water. The more commonly held understanding of water is as a resource to be regulated and controlled by neoliberal economic principles. For our purposes, we will call this framework the "Commodity School". However, this notion has been challenged in recent years by an emerging school of thought that claims water is a universal right to be provided regardless of what market conditions may be. For our purposes, we will call this framework the "Human Right School". Where riparian states are concerned, the differences between these baseline notions of water manifest themselves in the decisions of policymakers and in the activities of water-management institutions like South Asia's Mekong River Commission or the Permanent Indus Commission between India and Pakistan. When these differences go unnoticed or unaddressed, they can easily create barriers to the successful resolution of any given water dispute. As such, studying riparian states' water-sharing policies should include determining the school of thought that underlies the thought processes of the policymakers at the negotiating table.

2.2 The Commodity School

Considering transboundary water resources in a security studies context may be a relatively new framework in this field, but the basic conception of water held by the Commodity School of thought is tied to centuries-old political agreements. Salman M.A. Salman and Kishor

Uprety lay this correlation out in their 2002 book, *Conflict and Cooperation on South Asia's International Rivers: A Legal Perspective*, by reviewing a chronology of international river laws from the 1800s to their present day. These river laws primarily dealt with navigation rights and the use of shared rivers as a vehicle for expanding trade.[5] The focus on navigation in water laws would eventually shift to debates over riparian sovereignty and obligations to downstream neighbors due to the work of two multilateral organizations; the Institute for International Law (IIL) and the International Law Association (ILA).[6]

Today, fresh water has evolved from being framed as a largely environmental matter to being regarded as a possible source of international conflict, but many scholars retained that framing of water as an economic commodity; gradually propagating the ideas of the Commodity school of thought. The Indian scholar Ashok Swain touches on many of the ideas discussed by Salman and Uprety in his 2000 article, "Water Scarcity as a Source of Crises." Specifically, Swain investigates a number of civil conflicts based on water development projects that in turn caused population displacements near the projects' construction sites. He asserts that these conflicts combine with pre-existing factors like population growth to strain a state's per capita water availability, concluding that "Water needs to be treated urgently both as a social and an economic good, necessitating the strengthening of the institutional capacity of the state."[7] Swain's emphasis on states as the primary actors in water policy reflects the neoliberal disposition of the Commodity School. This neoliberal framing of water was echoed by the team behind *Management of Transboundary Rivers and Lake*s, written in 2008. Chapter 6 of this work

[5]Salman, Salman M. A. and Uprety, Kishor. *Conflict and Cooperation on South Asia's International Rivers*. Washington, D.C: World Bank Group, 2002, 8-10

[6]Salman and Uprety, *Conflict and Cooperation,* 13-20

[7]Swain, Ashok "Water scarcity as a source of crises." in E. W. Nafziger, F. Stewart & R. Väyrynen, eds., *War, Hunger and Displacement: The Origins of Humanitarian Emergencies*. Oxford: Oxford University Press, 2000, 202

applies the Commodity School concepts to the challenge of managing one of the other massive river systems of South Asia, the Ganges-Brahmaputra-Megna (GBM). Here, we see that another hallmark of the Commodity school of thought is the tendency to ground policy proposals in the ideas of the post-WWII capitalist system. Where transboundary water disputes are concerned, Varis et al argue that riparian states need only adopt a package of market-based solutions like trade liberalization, increased capital mobility among GBM states, and/or multilateral technology transfers.[8]

It is important to clarify here that not all Commodity School scholarship exists in perfect alignment. A particularly noteworthy divergence lies in discussions of how the force multiplying effects of climate change might compromise South Asia's water resources. Where authors like Swain and the team of Salman and Uprety discuss water policy in terms of state-level action, others argue that international institutions have a part to play in managing shared rivers. Heather Cooley and Peter Gleick's "Climate-Proofing Transboundary Water Agreements" warns against treating water as an exclusively state-level challenge because climate change alters environmental conditions on a global scale and does not acknowledge human notions of territorial sovereignty.[9] Cooley and Gleick challenge a notion from past decades that water security is chiefly a matter of quantity by raising the question of how climate change could affect water quality, and thus the security environment of a given region:

> Greater analysis is needed to evaluate how water quality will be affected by climate change within the context of transboundary agreements. Furthermore,

[8]Biswas, Asit K. "Management of Ganges-Brahmaputra-Megna System: Way Forward," in *Management of Transboundary Rivers and Lakes*, Springer Berlin Heidelberg, 2008, 142-164

[9]Cooley, Heather and Gleick, Peter H. "Climate-Proofing Transboundary Water Agreements." *Hydrological Sciences Journal/Journal Des Sciences Hydrologiques* 56, no. 4 (2011)

> regional climate-change assessments would be more valuable for informing transboundary management and treaty reform if researchers included key water impacts, such as quality, quantity, frequency and intensity of extreme events, and impacts on water demands.[10]

In essence, successful water management in the twenty-first century requires wide-reaching, interdisciplinary management programs that eclipse the more typical bilateral water treaties of the past.[11] Their push for multilateral mechanisms of cooperation is bolstered by more recent analyses of water frameworks by Marko Keskinen and Joseph Guillaume, as well as Andrea Gerlak and Farhad Mukhtarov, both in 2016. These authors suggest an interdisciplinary approach to crafting policy that situates water in a wider network of interlinked issues dubbed the "Water-Energy-Food Nexus (WEF)." This WEF Nexus approach integrates direct water consumption for drinking or cooking with the energy required to produce said water, along with the water inputs needed to grow crops and raise livestock, into a nuanced framing of water as a central driver of state growth.[12] In this, Gerlak and Mukhtarov echo the ideas of Cooley and Gleick in their assessment that some manner of multilateral effort is needed to manage transboundary waters. In this instance, Gerlak and Mukhtarov advocate for River Basin Organizations (RBOs) like the Mekong River Commission to promote sustainable, harmonious water-sharing among riparian states.[13]

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[10]Cooley and Gleick, *Climate Proofing*, 715

[11]Cooley and Gleick, 717-718

[12]Keskinen, Marko, Guillaume, Joseph Kattelus, Mirja, Porkka, Miina, Räsänen, Timo, Varis, Olli. "The Water-Energy-Food Nexus and the Transboundary Context: Insights from Large Asian Rivers." *Water (Basel)* 8, no. 5 (2016): 13

[13]Gerlak, Andrea K. and Mukhtarov, Farhad. "Many Faces of Security: Discursive Framing in Cross-Border Natural Resource Governance in the Mekong River Commission." *Globalizations* 13, no. 6 (2016): 723- 724

The Commodity school of thought is a neoliberal, capitalist framework for transboundary water management, despite some disagreement about the role of states versus multilateral institutions. To this school, water is a resource like wheat or gold that can be controlled within the current economic system as part of today's global supply chain, while simultaneously balancing current water needs with the realities of climate change.[14] The principles of this school originate in international legal issues of navigation and trade, indicating a clear priority on economic growth as a catch-all answer to questions of water security. From here, we turn to literature that challenges the financial emphasis of the Commodity School.

2.3 The Human Right School

In the last three decades or so, a growing body of literature states that governments should regard water as a universal right and legislate accordingly. To be clear, the Human Right school of thought acknowledges the importance of economic growth much like the Commodity school. However, this school remains primarily concerned with abstract concepts of human rights that are harder to codify into concrete law. For example, in 2017 the legal scholar Waseem Ahmad Qureshi reviewed a list of declarations and conventions from the United Nations that implicitly or directly address water as a human right. The agreements he cites include, among others: Article 55 of the United Nations Charter, Article 24 of the Convention on the Rights of the Child, the UN Watercourses Convention, the Stockholm Declaration, the Dublin Statement, and the more recent Political Declaration of 2016.[15] Qureshi's Pakistani perspective is on full

[14]Grey and Sadoff, *Sink or Swim,* 545-571.

[15]Qureshi, Waseem Ahmad. "Water as a Human Right: A Case Study of the Pakistan-India Water Conflict," *Penn State Journal of Law & International Affairs, 2017, 381-389*

display as he applies these international decrees to India and Pakistan's tense sharing of the Indus river system, but his emphasis on the United Nations as a key multilateral institution in shaping water security is by no means misplaced. The Human Right school of thought mostly originated in the work of globe-spanning bodies like the UN, much like the Commodity school originated in part from legal precedent set by the Act of Congress of Vienna in 1815.[16] To the Human Right school, concepts like water rights gain their legitimacy from the work of international institutions. States matter, but only as the mechanism for disseminating international consensus once it is decided. Primacy still lies with the international organizations where the right to water was born in the first place. In addition, the Human Right school has been experiencing a surge in momentum since the turn of the century, specifically in the form of, "…a significant upswing in [legal] cases addressing water issues through the lens of human rights [since 2000]…The timing of the turn to the right to water correlates with the oft-quoted General Comment No. 15 on the Right to Water by the UN Committee on Economic, Social and Cultural Rights (CESCR) in 2002."[17]

Scholarship espousing the Human Right school's framing of water places heavy emphasis on a sense of community spirit among riparian states; a sort of "we're all in this together" mentality. Chief among the proponents of the Human Right school is, perhaps unsurprisingly, the United Nations. Early in the 2000s, the UN published its first World Water Development Report titled, "Water for People, Water for Life," which tied the right to water to the role it plays in another established human right, the right to health.[18] Alongside these moral

[16]Salman and Uprety, 8-12

[17]Langford, Malcolm, and Anna Russell. *The Human Right to Water: Theory, Practice, and Prospects*. Cambridge-United Kingdom, United Kingdom, Cambridge University Press 2017, 6-7.

[18]United Nations World Water Development Report. "Water for People, Water for Life," UNESCO and Berghahn Books, Barcelona, Spain 2003, 99-126

arguments about human rights, the Human Right school frequently touches on ways that water sharing is a mutually beneficial act for all riparian states.[19] Equity and expanding access are the guideposts of the Human Right school.

Contemporary water security discourse is an evolving conceptual framework, so it is incumbent upon us to remember that it is too soon to fully categorize water as either a commodity or a human right. The boundaries between schools are still quite permeable, and while the Commodity and Human Right schools of thought diverge over solutions to South Asia's water crisis, they also share a few significant ideas. Both schools drew their founding ideas and sense of legitimacy from some form of international agreement among states. The Human Right school asserts that use of shared waters comes with a corresponding obligation to consider the needs of riparian neighbors downstream out of a sense of fairness.[20] The Commodity school shares this desire for riparian cooperation but approaches the issue from a legal standpoint. Salman and Uprety reference a particular line in Geneva Protocol of 1923: "If such development [of hydropower] involves the use of the territory of another state, or may cause prejudice to another state, those states shall enter into negotiations with a view to conclude an agreement."[21] Additionally, scholars from both schools acknowledge transboundary water's dual nature as a catalyst for both cooperation and conflict among riparian states. This duality is noted throughout 21st century literature by scholars like Swain in 2000, Grey and Sadoff in 2007, Cooley and Gleick in 2011, and Keskinen et al in 2016. More than anything, this shared recognition among diverging schools of thought speaks to just how complex inter-state relationships become where water-sharing is concerned.

[19]United Nations, *World Water Development Report*, 291-300
[20]Langford and Malcom, *The Human Right to Water*, 150
[21]Salman and Uprety, 17

Both schools of thought also appear to agree on the fact that, thus far, no single approach or policy exists that fully resolves all of South Asia's water troubles. Given the scale and variation of the hydrological profile of the region, it should come as no great shock that a one-size-fits-all strategy for transboundary water management continues to elude the international community. While the water-energy-food nexus concept from the Keskinen piece provides a multidisciplinary solution, the authors of the study were quick to note that, "…no commonly agreed definition or conceptual framework for the [water-energy-food] nexus has emerged and therefore different organizations and authors—intentionally or not—interpret its essence quite differently."[22] The team that wrote "Management of Transboundary Rivers and Lakes" in 2008 also stresses this truth among South Asia's rivers, writing that, "Therefore, in planning and management terms, it is simply impossible to consider GBM [the Ganges-Brahmaputra-Megna river system] as one system because of its sheer size, complexities and multinational character."[23] Whichever way one turns, complete solutions to the larger question of South Asia's water security have yet to be crafted. Such a perfect solution likely doesn't exist, meaning that further inquiry is warranted if only because the problem remains unsolved. In South Asia's context, all attempts to craft solutions to transboundary water disputes are still worth the work due to the ever-present potential for freshwater tensions to spark conflicts between riparian neighbors. Turning back to India and Pakistan in particular, the ever-present risk of escalation over the tributaries of the Indus river system threatens hundreds of millions of lives if that unthinkable yet quite possible nuclear exchange were to happen. There are still gaps in the

[22]Keskinen et al, *The Water-Energy-Food Nexus,* 1-2

[23]Varis, Olli, Biswas, Asit K., Tortajada, Cecilia, and SpringerLink. *Management of Transboundary Rivers and Lakes*. Water Resources Development and Management. Berlin, Heidelberg: Springer Berlin Heidelberg, 2008, 142

literature of these emerging schools of thought that should be filled in service of finding the next policy that resolves a given Indo-Pak water dispute even a tiny bit more effectively than the last attempt. I hope the findings of this inquiry will add value to the larger body of India-Pakistan security literature and bring us closer to a future where the Indus is no longer an existential threat to India, Pakistan, or any other state in South Asia.

To summarize, the idea of freshwater as a driver of security issues is relatively new to the broader discipline of security studies. Freshwater resource management began as a primarily domestic, environmental concern, but in recent decades this issue has grown into a critical aspect of state security as climate change grows more visible in daily life. Current water security literature reflects two predominant perspectives through which to view fresh water: as a commodity, or as a human right. The commodity school of thought holds that freshwater resources can be managed within the current neoliberal status quo, while the human right school of thought is more willing to challenge assumptions and push for larger reforms. Both schools of thought view states as primary actors, but disagree on the goals those actors should work towards. These two schools of thought draw legitimacy from different expressions of international agreement and espouse different policy solutions, but they are by no means mutually exclusive. Despite these differences, the underlying goal of both schools is providing water to as many people as possible; a task that remains incredibly difficult in many parts of the Indo-Pacific region.

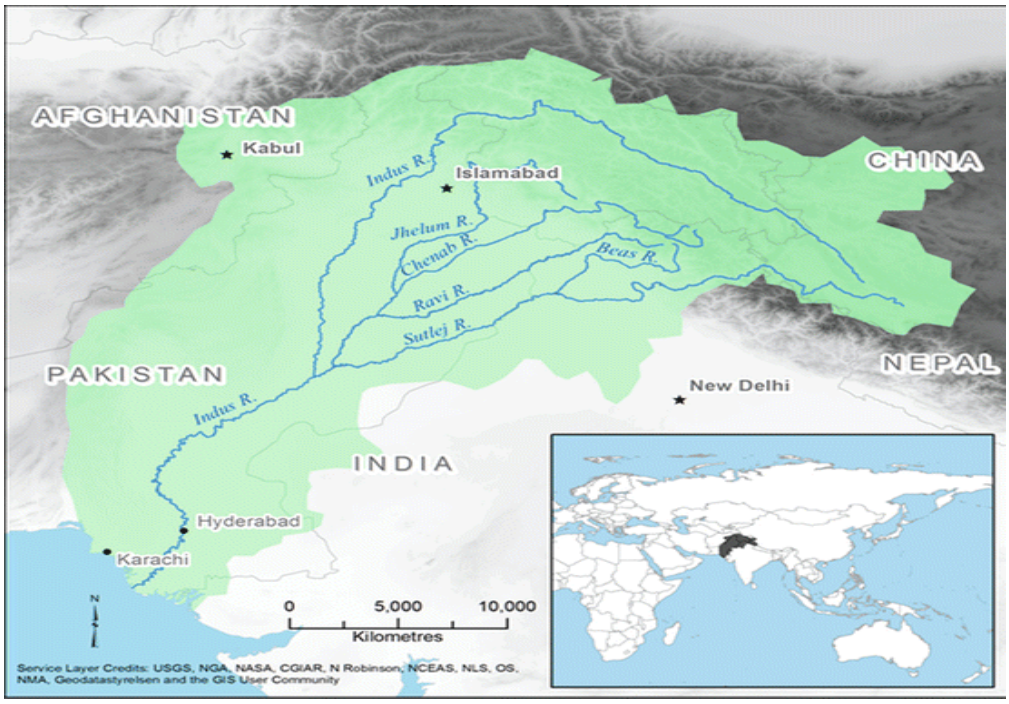
3. Historical Context: India-Pakistan Relations and the Indus

Much of the animosity that India and Pakistan hold towards one another can be traced back to the disastrous way that Pakistan was born. It was willed into existence as the British

withdrew their *Raj* government from colonial India just after World War II by drawing new lines on a map of the South Asia subcontinent. Arguably, what mattered most in the birth of this new state was the haste with which the British ceded their power. The process of creating Pakistan out of previously Indian territory was completed in just forty days, and the public announcement of this entirely new state was not made until just *after* it had come into legal effect.[24] The botched partition quickly sewed confusion and chaos among the citizens of India and newly formed Pakistan which sparked a horrific outburst of sectarian violence that reverberates through history to the present day. Approximately 1 million people were killed and many more were displaced,[25] and the India-Pakistan relationship has yet to fully recover from the trauma. Since the partition took place, these two states have fought several conventional wars and continue to experience a cycle of tit-for-tat skirmishes along their shared borders. The Indo-Pak conflict was supercharged over the course of the late 20th century when Pakistan achieved nuclear strike capability, causing India to follow suit not long after. Now, hundreds of millions of people living in South Asia face the risk of getting caught up in India and Pakistan's hostile relationship in the event that either state decided to launch a nuclear attack on the other.

[24]Chakrabarti, Shantanu, "Interpreting the legacy of Partition in the Subcontinent: Indian and Pakistani perspectives." *Politeja, no. 40 (2016):* 21-30.

[25]Talbot, Ian and Gurharpal Singh. *The Partition of India*. 1. publ. ed. Cambridge [u.a.]: Cambridge Univ. Press, 2009.



Davidson, Nick C. "Indus Waters Treaty." In *The Wetland Book: I: Structure and Function, Management and Methods*, edited by Finlayson, C. Max, Mark Everard, Kenneth Irvine, Robert J. McInnes, Beth A. Middleton, Anne A. van Dam and Nick C. Davidson, 1-4. Dordrecht: Springer Netherlands, 2016. https://doi.org/10.1007/978-94-007-6172-8_132-1.

After their first conventional war in 1947-48, India and Pakistan entered into negotiations over use of the Indus (pictured above) with the World Bank acting as mediator, eventually signing the landmark Indus Waters Treaty (IWT) in 1960.[26] Treaty Articles II through IV establish which state controls which tributary of the larger Indus system; with the Sutlej, Beas, and Ravi given to India, and the Indus (a namesake tributary), Chenab, and Jhelum given to Pakistan.[27] The treaty's objective of enshrining cooperative over competitive use of the Indus is highly visible throughout the document. Beyond merely deciding which state can use which river, the IWT's Article VI mandates regular bilateral data exchanges , and Article VII confirms

[26]United Nations Food and Agriculture Organization, (2011). *Indus river basin*. Rome, Italy. http://www.fao.org/nr/water/aquastat/basins/indus/indus-CP_eng.pdf

[27]United Nations, *Indus Waters Treaty between Pakistan and India*. United Nations Treaty Series, 1960, 2-5.

both states' "…intention to cooperate, by mutual agreement, to the fullest possible extent."[28] The principal mechanism of all this mutual cooperation is provided for India and Pakistan in the form of the Permanent Indus Commission (PIC), created by the language of Article VIII.[29] In addition, the architects of the IWT demonstrated incredible foresight by laying out methods for resolving disputes that would undoubtedly arise in the future; these being Article IX's Neutral Expert and Court of Arbitration processes.[30]

Despite continuing hostile relations between India and Pakistan, the IWT has not been broken to this day. However, the Indus Waters Treaty is far from perfect. First and foremost, the physical origin of the Indus river system lies in the Tibetan Plateau of Southwestern China and is fed by melting snow and ice from the Himalaya Mountains. That snow and ice is melting at increasing rates due to climate change, creating higher flood risk in the near-term and higher risk of drought in the long-term.[31] It is here that we can observe a weakness in the IWT; the original text does address how either state should respond to growing stress along the Indus resulting from climate change.[32] Considering how the physical environment of South Asia is already altering, India and Pakistan both have legitimate reasons to seek an updating of the IWT that brings reflects the climatic realities of the 21st century. Even so, the annual meetings of the PIC are largely formulaic and highly technical in nature, and the idea of jointly updating the Treaty has yet to gain any significant traction.

Simply put, Indo-Pak relations are immensely complicated on all fronts, including their shared water security environment. Both states mistrust and fear one another due to an intricate

[28] United Nations, *Indus Waters Treaty,* 6
[29] *Indus Waters Treaty,* 8
[30] *Indus Waters Treaty, 7-9*
[31] Bhattacharyya, Arpita and Werz, Michael. "Climate Change, Migration, and Conflict in South Asia: Rising Tensions and Policy Options Across the Subcontinent." Center for American Progress, 2012.
[32] United Nations, *Indus Waters Treaty*.

mix of historical, religious, and political reasons tracing back to the violence of partition. Yet they are trapped in their tense riparian relationship, meaning these wary neighbors must continue interacting with one another when utilizing the waters of the Indus system. This combination of factors spells out a formula for continued stress in the Indo-Pak relationship *before* adding in the force-multiplier of nuclear missiles pointed at each other. With all this in mind, there is a veritable mountain of reasons why India and Pakistan's negotiations over water might fail. Even so, laying the failure to improve the IWT on history would be overly simplistic. To be clear, it is fair to consider historical grievances, religious tensions, and cultural differences in any analysis of why India and Pakistan dislike each other. At the same time, we should not consign this issue to the bin of unsolvable global challenges. Doing so would be tantamount to committing hundreds of millions of South Asians to living their whole lives facing an existential threat of nuclear war that never dissipates, simply because past events happened the way they happened. Assigning responsibility for failed Indo-Pak water negotiations to historical issues also discounts the 70+ years of scholarly inquiry that have taken place since the partition. We must face the inconvenient truth that the 21st century is altering South Asia's physical environment in ways not witnessed at the time the IWT was signed. Only continued study will help refine our understanding of Indus security issues, and only continued effort will lead to the lasting solutions this admittedly daunting challenge requires. History, like climate change, is a living issue, and solving historical problems requires acknowledging them as events of the past that still play a role in South Asia's contemporary security environment.

4. Methodology

Returning to this inquiry's central question of what conditions are needed on-the-ground for a possible IWT renegotiation, there are a number of specific concepts and data points to examine as part of the selective coding process of a Grounded Theory approach. First, the baseline conception of water both states hold is highly valuable information when attempting to create a theory sufficiently grounded in Indo-Pak Indus policy. Even before considering other conditions for a successful international agreement like coinciding interests between two governments, domestic political goodwill, the capacity of both party's diplomatic corps, or strategic defense concerns, we must first attempt to confirm what the waters of the Indus system mean to India and Pakistan's governments as clearly as possible. If this information is not established up front, the risk of either state misunderstanding the other's proposals grows much larger, as does the risk of failing to reach any eventual agreement. Accordingly, I intend to answer this inquiry's research question by assessing each state's ideas and beliefs about water as they are reflected in the past twenty years of government policy. Through the use of Grounded Theory analytical techniques, I will uncover the critical ideas and relevant categories of information hidden in my data sample and use them to inductively generate a working theory that addresses my research question.

My analysis focuses primarily on determining which of the two schools of thought are practiced by India and Pakistan, but other issues connected to Indus water security were included as well. For example, climate change-related hazards experienced in South Asia are an important aspect of transboundary water security. I began by segmenting information from my data in an open coding process to filter out aspects of Indus water policy that are only somewhat connected

to my research question. In particular, the numerous manifestations of climate change in the Indo-Pacific region deserve our attention, so the open coding process will further parse the phenomenon of climate change into a set of specific outcomes such as rising heat, flooding, droughts, and melting Himalayan ice and snow. Once enough open coding was completed, a number of climate change impacts could be discarded as largely irrelevant to this study, such as the growth in disease-carrying pest populations. The remaining concepts and the properties they hold formed a set of axial codes that I used as analytical lenses through which to continue dissecting data and adjusting the theory I was developing. To make this process as effective as possible, I used the mixed-methods research platform Dedoose to structure my analysis and findings. After the open coding process highlighted which concepts are most relevant to my central issue of which water school of thought each state holds to, I narrowed my focus to those critical concepts that became the foundation of my axial codes. By rearranging these axial codes in ways that differed from those used during open coding, I examined the intersecting points of these codes and to further refine my theory of conditions that can produce successful Indo-Pak negotiations over the IWT. I also drew on the many memos I wrote throughout the coding process in order to adjust my developing theory when necessary.

To assist in gathering my data sample, I identified the departments of the central governments of both India and Pakistan that are involved in setting water policy. The scope of this research is intentionally restricted to the 21st century due to time constraints, meaning only documents dated January 1st, 2000 or later could be included. Since this inquiry was specific to the Indus alone, data sources referring to the other major rivers of South Asia were excluded. For example, India's policies regarding the Ganges or Brahmaputra rivers were not directly relevant to my research question, so those rivers will have to wait for another study.

When evaluating any security environment, it is important to remember that state governments convey their priorities and beliefs in the responses they give to real or perceived stress. Since matters of Indus water security have reached the international stage, my data will also come from sources outside India and Pakistan. Regarding which sources to use outside my two principal states, water is often addressed at relevant meetings of the United Nations attended by India and Pakistan. For example, the United Nations General Assembly (UNGA) convenes meetings of the Human Rights Council (HRC), where water and food security are often discussed. The United Nations Food and Agriculture Organization (FAO) is involved in debating water issues as well. Accordingly, I mined the UN Digital Archive to pull joint statements, declarations, agreements, and/or speech transcripts that mention water and involved either India or Pakistan (or both). In addition, another important method that governments employ to signal their beliefs and priorities is when a current official writes an article for journalistic outlets or appears on TV programs to discuss policy. Sensitive information will not be included in a newspaper article of course, but even the comparatively simple language used in an Op-ed by a Pakistani government official can offer quite rich data. Consequently, I pulled a small sample of articles from the *Times of India's* online archive, as it is the largest journalistic archive of news originating in the region that is available to me.

The earlier literature review outlines a central phenomenon to follow in this research project; the question of which school of thought is being employed (Commodity or Human Right), by which state(s), and in what context. With data sample in hand, I used the central ideas and concepts drawn from reading each document to create a set of defined codes that I input into Dedoose as part of the open coding process. This stage of the research process was conducted a alongside the axial coding process as well, with adjustments to my codes in Dedoose made as

necessary. Taking these steps ultimately contributed to more compelling results during the selective coding process later on in the project. In addition, the revisions I made yielded a final set of codes, a 'Code Tree,' that more accurately illustrated and supported my findings.

As just mentioned, I used Dedoose throughout open, axial, and selective coding to pore through India and Pakistan's water policies from the past two decades. Once the analysis was complete, I used my findings to form the basis of a theory that attempts to answer the research question of this project, repeated here: *What baseline conditions are needed in the 21st century to facilitate a possible renegotiation or updating of the 1960 Indus Waters Treaty between India and Pakistan?* It is important to clarify here that I did not intend to answer whether *all* (or *none)* of these conditions for successful negotiation were present, as the timing of this project strictly curtailed how deep I might have dug. The scope of this research also precluded investigating whether or not bilateral negotiations *always* succeed if certain conditions are present, or if these conditions just mean success is more likely. Rather, I looked for the presence of what I believe is the most crucial condition for success; Namely, whether India and Pakistan share the same conception of water or not. The policy proposals shared during an Indo-Pak negotiation over the IWT should, at the very least, remain grounded in a mutually held view of what the waters of the Indus mean to each party. If both states espouse conflicting views of their shared waters, we will know that this fundamental dissonance between the two states must be resolved before any future negotiations over the Indus might occur.

5. Key Findings and Discussion

The key findings of this inquiry are briefly outlined below, with a more detailed discussion following accordingly. Each finding is backed with corresponding evidence from Dedoose listed in Appendix II. As mentioned earlier, this inquiry's primary data came from a number of Indian and Pakistani government agencies, newspaper articles, and the relevant parts of the United Nations. Specifically, the following is a short list of sources where this data was obtained:

<u>India & Pakistan Sources</u>

The Ministry of Foreign Affairs	The Ministry of Environment
The Ministry of Climate Change	The Office of the Prime Minister
The Ministry of Planning, Development, & Reform (Pakistan)	The Ministry of Water Resources
The Permanent Indus Commission (India)	The Permanent Indus Commission (Pakistan)

<u>Other Sources</u>

The Times of India	The UN General Assembly (UNGA)
The UN Human Rights Council (HRC)	The Permanent Court of Arbitration

5.1 Key Finding #1: Likely the most significant finding of this inquiry is that India and Pakistan do not take an "either/or" approach to the schools of thought about water security, but rather employ *both* the Human Right and the Commodity schools. The literature review established that the Human Right and Commodity schools hold some common ideas, but the schools' natural points of divergence also raise a question of how compatible (or incompatible) they could

ultimately be. If we were somehow able to confirm that a Commodity School approach to water policy was fundamentally irreconcilable with a Human Right school approach, such a finding would present a serious impediment to future Indus river collaboration as long as India and Pakistan held opposing views. The relationship between these two states is tense enough already, but this conclusion indicates that a greater degree of commonality is indeed achievable.

5.2 Key Finding #2: Pakistan and India both show a significant preference for employing the highest levels of government to convey Indus water policy in public view (e.g. speeches and/or the text of government documents). The data indicates a higher rate of speeches being made by policymakers that represent Ministry/Cabinet-level authority or higher (See Appendix II, Figures 1 and 2). We will discuss the implications of this finding shortly.

5.3 Key Finding #3: India and Pakistan do not directly mention each other in their respective policy documents (Figure 3-6), a conclusion that contrasts with both states' use of inflammatory rhetoric when it suits their purposes. This finding tells us a few interesting things about each government's metaphorical state of mind and the presence (or absence) of rational actors, which will be discussed in detail in a moment.

5.4 Discussion of Key Findings

As just mentioned, Finding #1 is likely the most significant result of this inquiry because it illustrates two items to consider while polishing the eventual theoretical framework that corresponds to the research question at the center of this study. First, it confirms that, where

water security is concerned, the Commodity and Human Right schools of thought are not mutually exclusive frameworks. Secondly, it establishes that the central governments of India and Pakistan do indeed share a similar perception of what the Indus means to their respective states. Those views are not perfectly aligned of course, but they do not need to be identical to still support continued attempts at Indo-Pak hydro-diplomacy. This shared understanding of the waters of the Indus does not guarantee anything, but it does provide a strong incentive for both states to attempt the admittedly difficult task of updating any part of their water-sharing treaty.

To further illustrate Key Finding #1, consider an example from one of the primary sources of this investigation. The Preamble of India's 2012 *National Water Policy* reads:

> With a growing population and rising needs of a fast-developing nation as well as the given indications of the impact of climate change, availability of utilizable water will be under further strain in future with the possibility of deepening water conflicts among different user groups. Low consciousness about the scarcity of water and its life sustaining and economic value results in its mismanagement, wastage, and inefficient use, as also pollution and reduction of flows below minimum ecological needs. In addition, there are inequities in distribution and lack of a unified perspective…[33]

Recalling the literature review and the underlying principles informing the Commodity and Human Right schools of thought, we can see how both schools are reflected in the above passage. The Commodity school's emphasis on water as an economic driver is stated literally in

[33] Ministry of Water Resources. *National Water Policy (2012)*, Government of India, New Delhi, India, 1.

the line, "…the scarcity of water and its life sustaining and economic value…," while the Human Right school's focus on expanding access to water for vulnerable populations is represented by the last line, "In addition, there are inequities in distribution and lack of a unified perspective…"[34] Sentiments like the one above are present throughout the Indian policy documents in this inquiry's data sample.

To further confirm that the Human Right and Commodity schools of thought are not mutually exclusive, we must also consider examples from the Pakistani government. Two successive passages from Pakistan's 2002 *National Water Sector Strategy, Volume 2* show how ideas from the Commodity and Human Right schools can be melded together. In this document's list of national objectives for Pakistan's water sector, we see that the first two items relate to expanding access to both clean water and functional sewage systems for the urban population, while the next part of the list lays out the state's financial objectives in terms of cost recovery, financial viability, and private sector participation in the water sector.[35] Similar passages expressing varying combinations of Commodity and Human Right school ideas can be found throughout both states' parts of the data sample. The notations and memos I wrote in Dedoose during open and axial coding provide additional evidence that mixing the two schools is a fairly common practice. Ultimately, the fact that India and Pakistan are not approaching their water security relationship from diametrically opposed stances constitutes what I believe to be the most critical baseline condition for updating the IWT, and a bedrock aspect of my theory of successful Indo-Pak water negotiations; *a shared understanding of the water over which they negotiate*.

[34] *National Water Policy (2012)*, Government of India

[35] Ministry of Water and Power. "National Water Sector Strategy: Volume 2," Government of Pakistan, 2002.

Turning now to Key Finding #2, here the data from the axial coding phase indicates a high level of commitment to Indus water security shared by the governments of India and Pakistan. The data shows that both states engage one another with Cabinet/Minister-level officials or heads of state; a very positive sign. This finding means that, for a hypothetical, Pakistan's Foreign Minister is not being met by undersecretary-level officials from India during water-related bilateral engagements, or vice versa. If this imbalance did occur, either government would feel slighted by the others' lack of commitment and quite possibly walk away from the negotiating table regardless of topic. Considering the government offices that supplied the documents of this data sample, Key Finding #2 confirms that both states convey the seriousness of their intent by disseminating it from elevated positions on the chain of command, so to speak. For example, when the Pakistani government wanted to emphasize water security in a global forum in 2015, Prime Minister Imran Khan himself delivered those remarks (See Appendix I). A similar (though not identical) level of dedication to water security is visible in India's decision to merge its formerly disorganized water policy apparatus into the *Jal Shakti* Ministry.[36] Turning to the working theory that this inquiry seeks, we can confidently state one part of it here: *One of the conditions needed to facilitate a renegotiation or updating of the IWT is a matching level of commitment shown by both states, preferably at the highest levels of power.*

Finally, Key Finding #3 indicates that there were very few if any instances of one state mentioning the other by name anywhere in the data sample (See Appendix II). To be clear, this inquiry is focused on a small sample of data, and more direct mention of either state is entirely possible. Even so, domestic policy documents do not typically refer to other states beyond vague expressions like, "working with partners and allies." But this lack of calling one another out in

[36] "Govt Forms 'Jal Shakti' Ministry by Merging Water Resources and Drinking Water Ministries." Edited by Sreekumaran Nettath, *BusinessLine*, The Hindu BusinessLine, 31 May 2019

policy documents contrasts with strident rhetoric found in more public discourse. Consider the tense exchange between India and Pakistan in 2016, when Prime Minister Modi suspended recurring Permanent Indus Commission talks until Pakistan-sponsored terror ended in India. This declaration by Modi prompted Pakistani Foreign Affairs Advisor Sartaj Aziz to immediately reply that revoking the IWT could be considered an act of war, and Pakistani Senator Sherry Rehman to accuse India of adopting a policy of "water terrorism" against Pakistan.[37] If we knew nothing of India and Pakistan's policy documents, public exchanges like this one would raise more than a few alarm bells. But by looking at the moderated phrases of both states' policy documents, we can feel a bit more reassured that the underlying policies of these two states are not fully driven by toxic animosity. Essentially, this finding indicates that Indo-Pak relations have not degraded as far as accusations of "water terrorism" might lead us to believe. Both state governments are led by actors who make rational choices based on information available to them. As an element of an overarching theory of the conditions for successful IWT renegotiation, Key Finding #3 points to another vital baseline: *the continued presence of politically rational actors in control of both governments*.

Though still incomplete at this stage of the process, the three Key Findings of this research project can be combined to generate a preliminary framework to guide future hydropolitical engagements between India and Pakistan. For any chance of success, India and Pakistan must come to hold a certain level of alignment in order to possibly renegotiate the Indus Waters Treaty. Consider the findings of this study as examples of what shape this alignment might take: a common perception or understanding of the water itself, a matching level of commitment at the highest levels of government, and the continued presence of politically

[37] "Revocation of Indus Waters Treaty Can Be Taken as an Act of War: Sartaj Aziz." Edited by Dawn.com, *DAWN*, 27 Sept. 2016, www.dawn.com/news/1286437.

rational actors in control of both governments. With this operational theory in mind, the path forward in this line of water security-related inquiry grows a bit clearer. This research does not provide a complete solution, but it does demonstrate that there is ample room to build on its findings in future study.

6. Research Design Discussion

Considering the findings discussed above, my preconceptions of Indo-Pak water security were quickly proven to be a bit narrow in scope. My early understanding of the Commodity and Human Right schools of thought regarded water as an "either/or" resource; either a commodity to be controlled by neoliberal market forces, or a human right to be managed by states acting out the consensus of international institutions devoted to equitable access. But at the end of this inquiry, it is clear that the governments of India and Pakistan employ a "both schools" approach to their water policies. This more nuanced view of the Indus should offer a small degree of relief to worried onlookers within and beyond the region. When even a slight misunderstanding could catalyze a nuclear exchange of any scale, any and all information that could lower that possibility is most welcome.

Invariably, there were a number of limitations to grapple with during this project, some intentional and some not. In the beginning, I framed this study with the intent of focusing on water alone, but in hindsight this choice was overly narrow. My initial data sample contained a number of documents related to the idea of a human Right to Food, but they did not directly speak to the connection between food and water. This relationship was heavily implied in these food-related data sources, but the connection was not clear enough to draw conclusions from. As a result, I felt compelled to discard nearly half of my data sample and consider only those

documents directly relating to the riparian aspect of the broader Indo-Pak relationship.

Eventually, my data sample became unbalanced from its even split between Indian and Pakistani sources . In the end, these primary sources were skewed towards Indian documents and away from the corresponding papers from Pakistan. Additionally, the data sample was no longer balanced across the twenty-year timeframe of the investigation as the initial data sample was. Secondary sources provided useful reference material to fill in the gaps, but they did not directly represent the governments of India or Pakistan and thus could not be considered primary data. Redefining this inquiry to include the Right to Food and its inherent connection to water security could have generated more robust findings, but also would have expanded the data sample and scope of this project far beyond what was realistically possible while still operating within the parameters of this project. If I could repeat this research, I would ideally do so in close cooperation with a small research team which would have permitted the expansion my research question to touch on food production as a factor in the Indus water security environment. In any case, my findings likely changed as a result of these exigent circumstances, but that just means there is ample room for continued research on the Indus and its role in South Asia's security environment.

My research design was also hindered by the inevitable language barrier issues that so often accompany research in the international affairs arena. Relying on English translations of documents naturally reduced the availability of primary data accessible on the Indian and Pakistani government's relevant websites. Perhaps the native versions of these sites have additional documents that would provide even greater impetus to assemble a research team with appropriate language skills for any future projects. For a perfect illustration of the linguistic

challenge one faces during the research process, consider the very first passage in the Preamble of Pakistan's 2009 *National Drinking Water Policy*:

> The Government of Pakistan, while recognizing that access to safe drinking water is the basic human right of every citizen and that it is the responsibility of the state to ensure its provision to all citizens, is committed to provision of adequate quantity of safe drinking water to the entire population at an affordable cost and in an equitable, efficient and sustainable manner.[38]

The language issue we see here changes depending on which of the two national languages was used in writing this document, Urdu or English. I could not confirm this question either way, as I could not contact the original authors of the document itself for clarification. But even if it was first written in English by a native speaker, consider just one word in the above passage: "while." This word can be read in two different ways, with each reading changing this sentence's meaning dramatically. The first Oxford definition of "while" includes the meaning, "at the same time" and includes the word "meanwhile," where the second Oxford definition of "while" includes the meaning "whereas" that indicates a contrast of some kind.[39] So if we were to assume the first definition, the word "while" means the ideas of this entire sentence are *inclusive* of each other. So one may interpret this passage as stating that the government of Pakistan recognizes the human right to safe drinking water *at the same time as* it is committed to providing this resource, sufficiently and equitably, *at an affordable cost*. In this reading, the passage takes the "both

[38] Ministry of Environment. *National Drinking Water Policy*, Government of Pakistan, 2009.
[39] Oxford Learner's Dictionaries. Definition of "while," 2021, https://www.oxfordlearnersdictionaries.com/us/.

schools of thought" stance in asserting that water is both a human right and a commodity to be provided "at affordable cost" (as in, not for free). In contrast, the second definition of the word “while” puts the main ideas of the passage in contrast with one another. One might rephrase this sentence to read as the government of Pakistan acknowledging the human right to water and states its commitment to providing it sufficiently and adequately, *but* at a cost. If the first reading is an "inclusive" stance where both the right to water and its equitable provision at cost are considered, the second reading indicates that the government of Pakistan acknowledges the right to water but chooses to frame its water policy in terms of provision at an affordable cost. This second reading implies that Pakistan’s larger motive is the issue of cost rather than the issue of providing water to all.

Both the Commodity and Human Right schools of thought are reflected in both readings of the above passage, but that second reading also communicates that Pakistan's government is tacitly aware that it cannot provide water to its people without a certain cost. In the reading of a single word, we can see two distinct interpretations that shift the Pakistani government closer to the "Commodity" school than the "Human Right" school, even if only by a degree. Such is the unavoidable nature of conducting research outside one’s native language(s).

There is one other limiting factor in my research design that is worth discussing here, the same limitation that has recently upended large cross-sections of global society: COVID-19. The pandemic introduced an exhaustive (and exhausting) list of obstacles to the research process, both physical and mental. Suffice to say, recreating this research should ideally take place in a post-pandemic setting, but when that may be is a question for the Center for Disease Control and/or World Health Organization.

7. Conclusion

Climate change in South Asia is much more visible in 21st century life than it was when the Indus Waters Treaty was signed in 1960. Thankfully, the treaty has survived countless border clashes, terrorist attacks, and several conventional wars between India and Pakistan without being breached. However, both states have legitimate reasons to seek an updating of the IWT that reflects the growing pressure climate change is applying to the Indus; a pressure that was not well known when the treaty was originally written. Beyond climate change, both states face rising demand for water due to their respective demographic and economic growth, which raises the question of what prerequisite conditions are needed to succeed in international agreements. To this end, I have attempted to examine whether any hydropolitical common ground might exist in the contemporary India-Pakistan relationship. The results of this inquiry can be formulated into the beginning of a theory of the conditions for success in bilateral riparian negotiations. To raise the chances of success, India and Pakistan must share (at least) a common understanding of the water over which they negotiate, a matching level of commitment to water security at the highest levels of government, and the continued presence of politically rational actors in control of both governments. There are likely other conditions to search for, but these three operate as a foundation for future academic inquiry as well as for future riparian engagements between India and Pakistan.

Considering the research agenda of the water security community beyond South Asia, I am confident that there is value in further exploration of exactly how fresh water influences bilateral interactions among riparian states. Since climate change is altering each tributary of the larger Indus system in different ways, a one-size-fits-all inquiry may not be the most effective

approach. Instead, future researchers could attempt to identify and measure how each individual tributary influences Indo-Pak security. That knowledge could dovetail with other research exploring how directly (or indirectly) the Indus acts to connect climate change to the risk of a nuclear exchange between India and Pakistan. Within the umbrella concept of climate change, each type of environmental change is worth exploring. Literature discussing the link between heat and the risk of political violence already exists as relates to Africa, but why stop there? This causal relationship is certainly worth investigating in South Asia as well given the fact that rising heat is already documentable throughout the region. If rising heat can increase the risk of violence, can improved access to water mitigate the underlying grievances that might inflame a group of people to violent acts? The need to understand questions like these and others like them will only grow as time passes and climate change becomes a more pronounced element of human society.

Additionally, this inquiry touches on the topic of international agreements, another topic that should be factored into future studies of the Indus. Exploring how freshwater resources influence the success or failure of bilateral or multilateral agreements could bolster practitioner and policymaker attempts to craft more effective treaties. Maybe the theory begun by this inquiry could be expanded upon by studying bilateral agreements specifically related to each shared river around the world. Since international agreements often involve coercion and/or a mutually beneficial alignment of interests, determining where water security fits into this picture would be valuable data for future negotiations over transboundary rivers in or beyond South Asia. Going forward, any attempt to understand how our changing waters will in turn change our lives is worth pursuing. Future inquiries in this area would benefit immensely from native language capabilities and a small team of researchers to assist in analyzing and processing data. The

findings from this particular river may generate a new framework or set of best practices to employ when studying other disputed water sources like the Colorado or Rhine Rivers. Additionally, a thorough examination of the interplay between the right to water and the right to food would add depth to future studies of the Indus or any other transboundary river.

All of the transboundary water resources of the world are growing increasingly stressed by a combination of climate change and the endless development of human civilization. This research confirms the fact that problems of water quantity, quality, and equitable access will only grow more urgent as time passes and climate change further alters our physical world. In the case of the Indus river system, these waters play a large role in the still-hostile relationship between India and Pakistan that threatens South Asia with nuclear annihilation. Continued study of the water security environment along the Indus system is clearly warranted given the risks involved.

Shared rivers also pose a unique challenge to the long-held principle of territorial sovereignty. The political borders of human society do not align neatly with the physical locations of these water resources, and constantly attempting to bend nature to fit the lines on our maps is an exercise as arrogant as it is futile. With climate change looming over the rest of the 21st century and beyond, perhaps the time has come to fundamentally redefine the concept of sovereignty in a way that reflects the realities of the physical environment upon which we depend for our continued existence. The continued existence of human civilization relies on water, as does the pursuit of stability and prosperity. The more we do to understand the relationship between freshwater resources and security across the globe, the better off humanity will be in the long run.

Appendix I
Citations for primary sources comprising the data sample.

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Appendix II

Using the "Descriptor Fields x Code Count" display tool in Dedoose, the following data indicates the frequency with which a certain level of state authority is employed to communicate water policy. Figures 1 and 2 below refer to Key Finding #1 on pages 21-22.

Figure 1 – India

Descriptor x Code Count Table

Descriptor Set: India Sort Field: Title (Down)

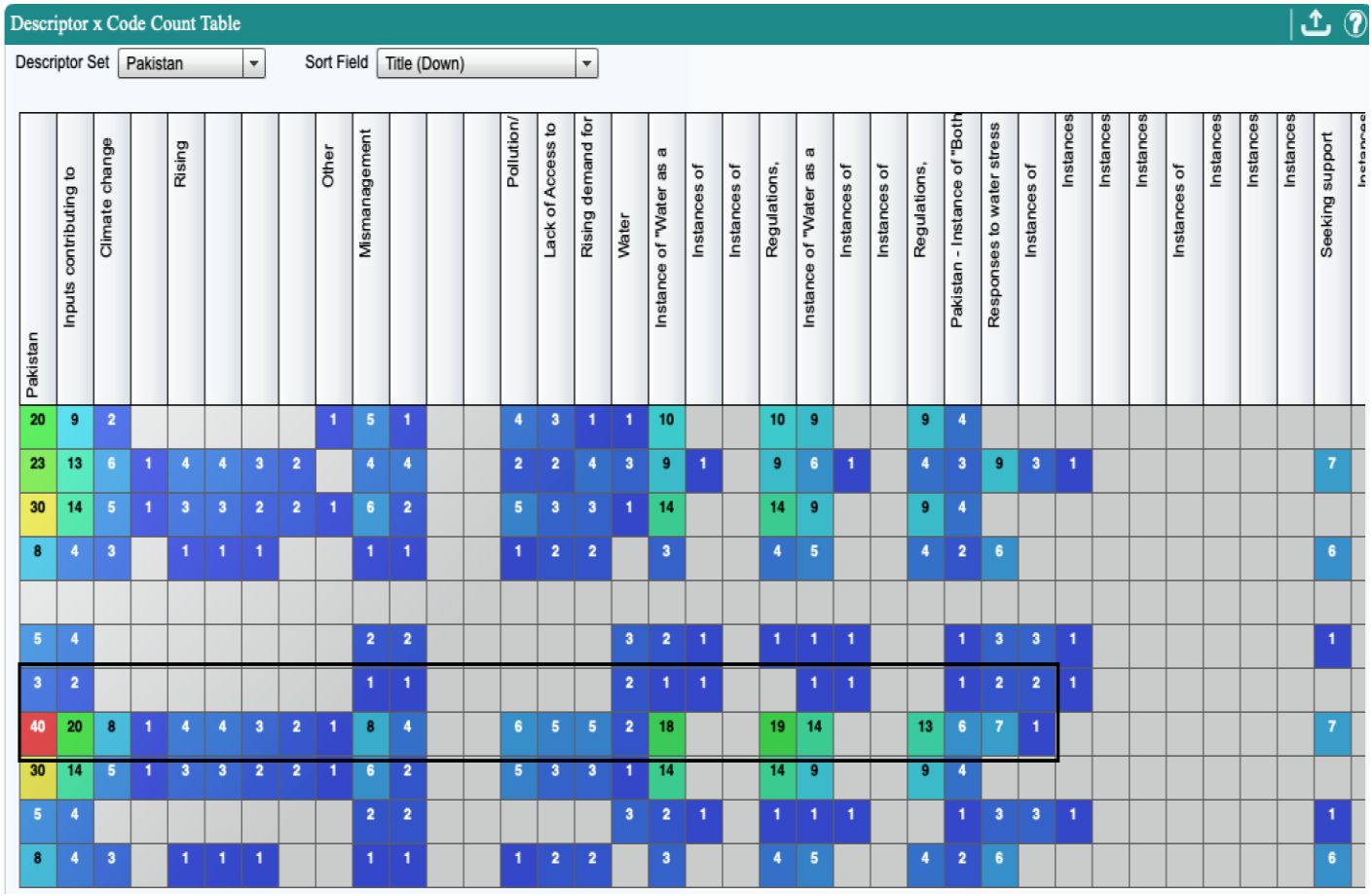
Descriptor Field \ Codes	India	Inputs contributing to	Climate change		Rising				Other	Mismanagement	Inefficient	Pollution/	Lack of access to	Rising demand for	Water	Instances of "Water as	Competition/	Cooperation/	Regulations,	Instances of "Water as	Competition/	Cooperation/	Regulations,	India - Instance of "Both	Responses to water stress	Competition/	Instances
Time Period: 2000-2009	37	18	6		3			2	3	6	3	5	1	3	2	20	1		19	13			13	8	2	1	1
Time Period: 2010-2020	50	21	5	1	4	5	4	1	5	15	12	7	3	4	1	23			23	25			25	13	2		
Method of Communication:	3	3	3		2			2	2						1	1	1								1	1	1
Method of Communication:																											
Method of Communication:	84	36	8	1	5	5	4	1	6	21	15	12	4	7	2	42			42	38			38	21	3		
Method of Communication: Public																											
Level of authority (of speaker):	3	3	3		2			2	2						1	1	1								1	1	1
Level of authority (of speaker): Head	84	36	8	1	5	5	4	1	6	21	15	12	4	7	2	42			42	38			38	21	3		
Domestic or Foreign Audience (or	10	8	5	1	4	2	1	3	3	4	4	1			1	3	1		2	3			3	1	1	1	1
Domestic or Foreign Audience (or	77	31	6		3	3	3		5	17	11	11	4	7	2	40			40	35			35	20	3		
Domestic or Foreign Audience (or																											

Source: Dedoose

The top row within the black rectangle represents authority figures of the advisor level or lower, whereas the bottom row represents authority figures at the head of state level. In this inquiry, "head of state" level of authority also includes Ministry/Cabinet-level officials. For example, the highest level of state authority was used to address the following:

1. Total number of times India utilized a "head of state" authority figure: 84 codes
2. Inputs contributing to climate change: 36 codes
3. Ideas and/or policies representing the "Commodity" school of thought: 40 codes
4. Ideas and/or policies representing the "Human Right" school of thought: 38 codes

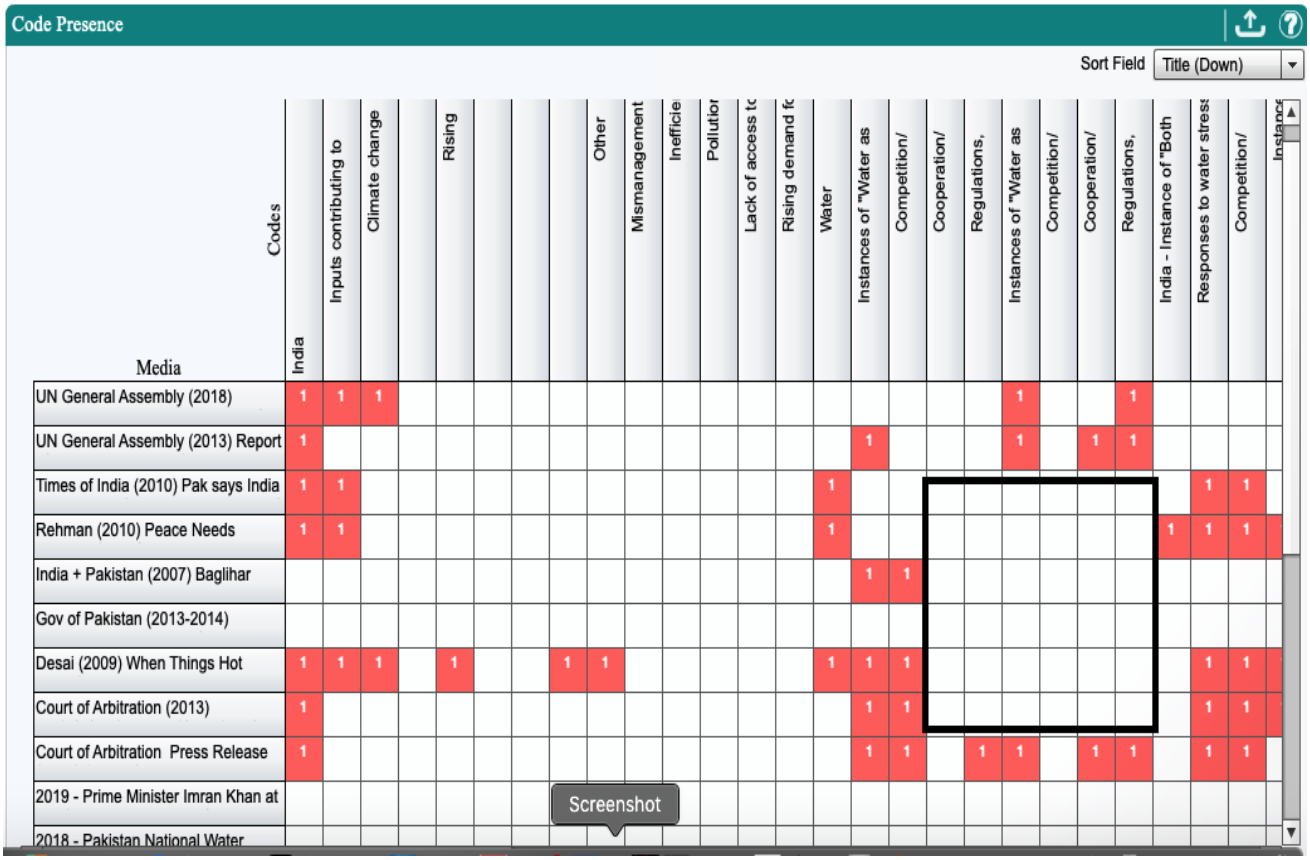
Figure 2 – Pakistan



Source: Dedoose

Figure 2 displays the same data fields as Figure 1, linked to Pakistan's policy documents instead of India's. Again, this is the "Descriptor Fields x Code Count" display tool in Dedoose, used to indicate the frequency with which a certain level of state authority is employed to communicate water policy. Figures 1 and 2 refer to Key Finding #1 on pages 21-22. Unfortunately, these counts are much lower than they should be due to the imbalance in my primary data that occurred late in the coding process. Too many of the sources discarded were from the government of Pakistan, resulting in India's higher counts and Pakistan's lower counts.

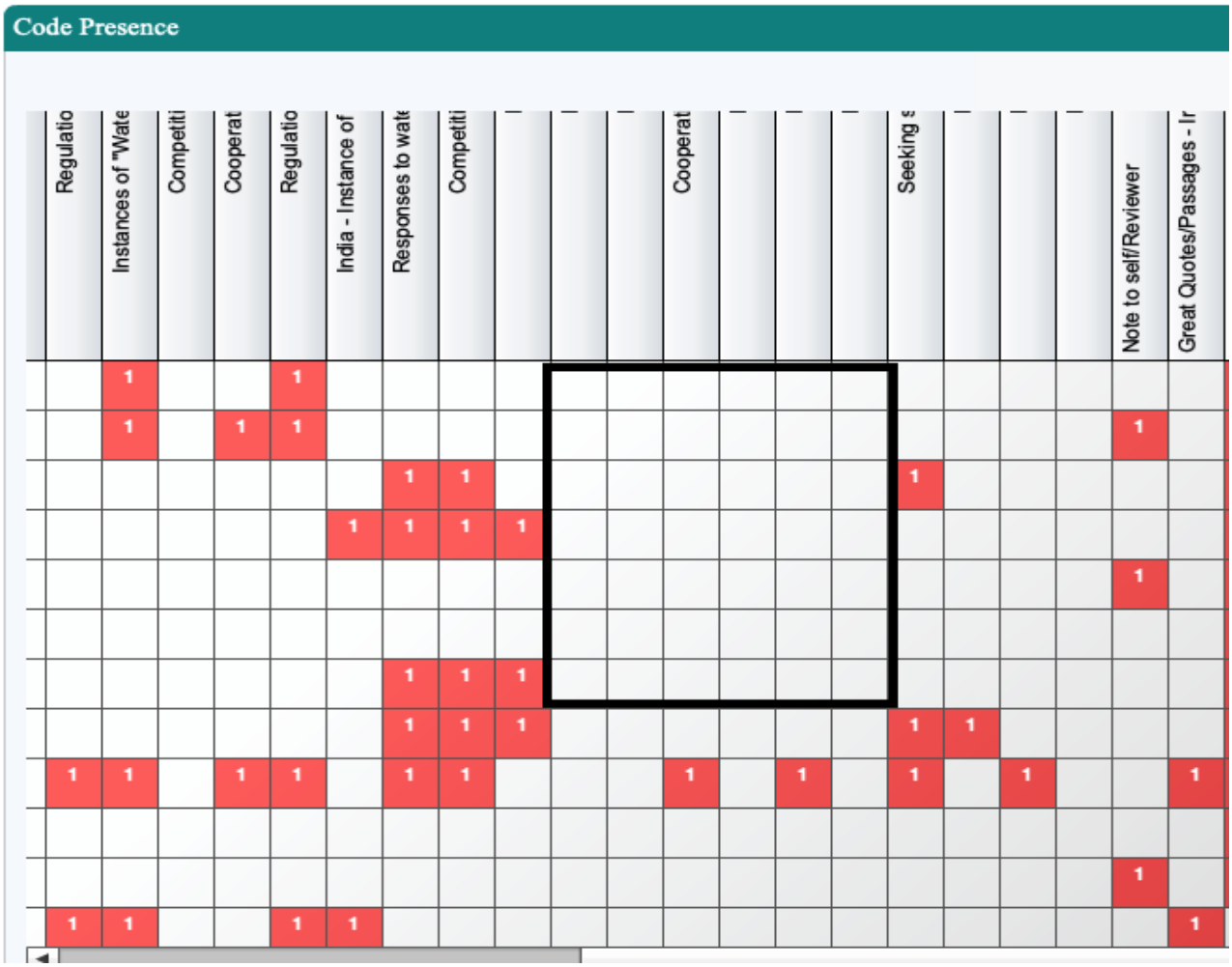
Figure 3 - India/Pakistan Code Presence



Source: Dedoose

The Code Presence chart in Dedoose indicates whether a given code was applied or not. A '1' means the code is present, whereas a blank square means the code is not present. The blank spaces within the black square are instances where primary source documents from India, Pakistan, and/or an outside actor touched on ideas of the Commodity or Human Right schools of thought and *did not* mention conflict/competition nor cooperation with the upper/lower riparian (India → Pakistan or Pakistan → India). Figures 3-6 refer to Key Finding #2 on page 22.

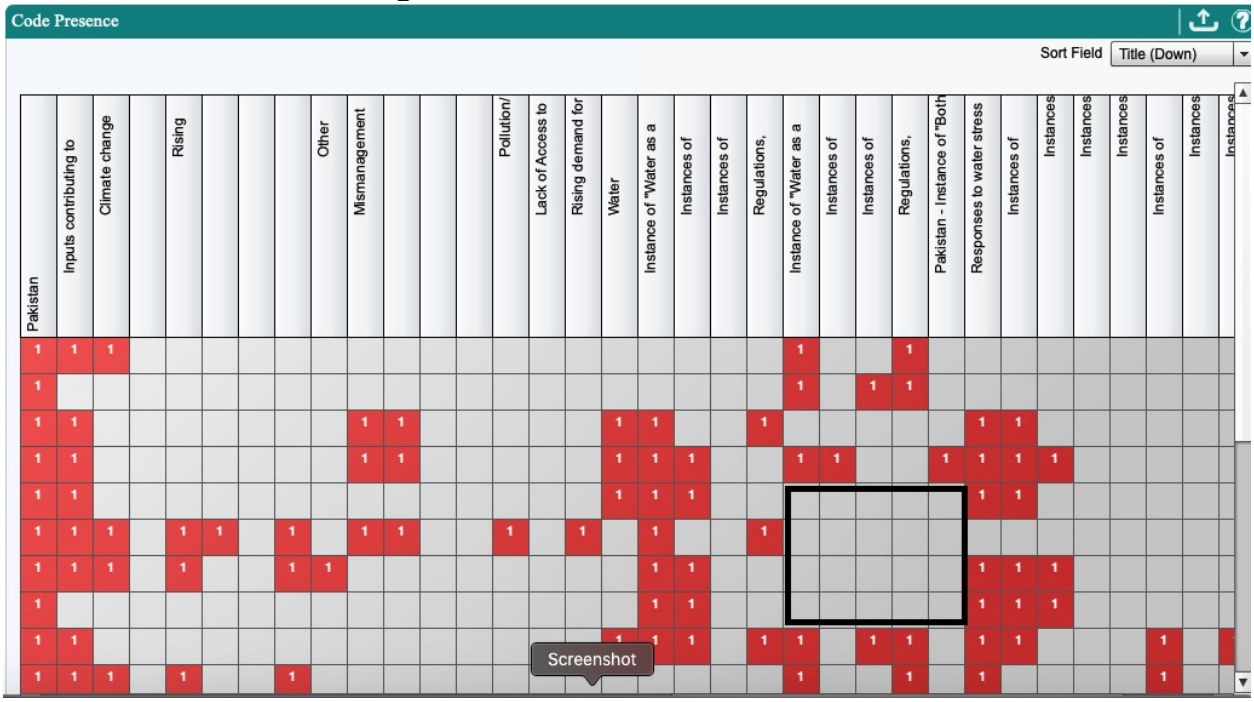
Figure 4 – India/Pakistan Code Presence



Source: Dedoose

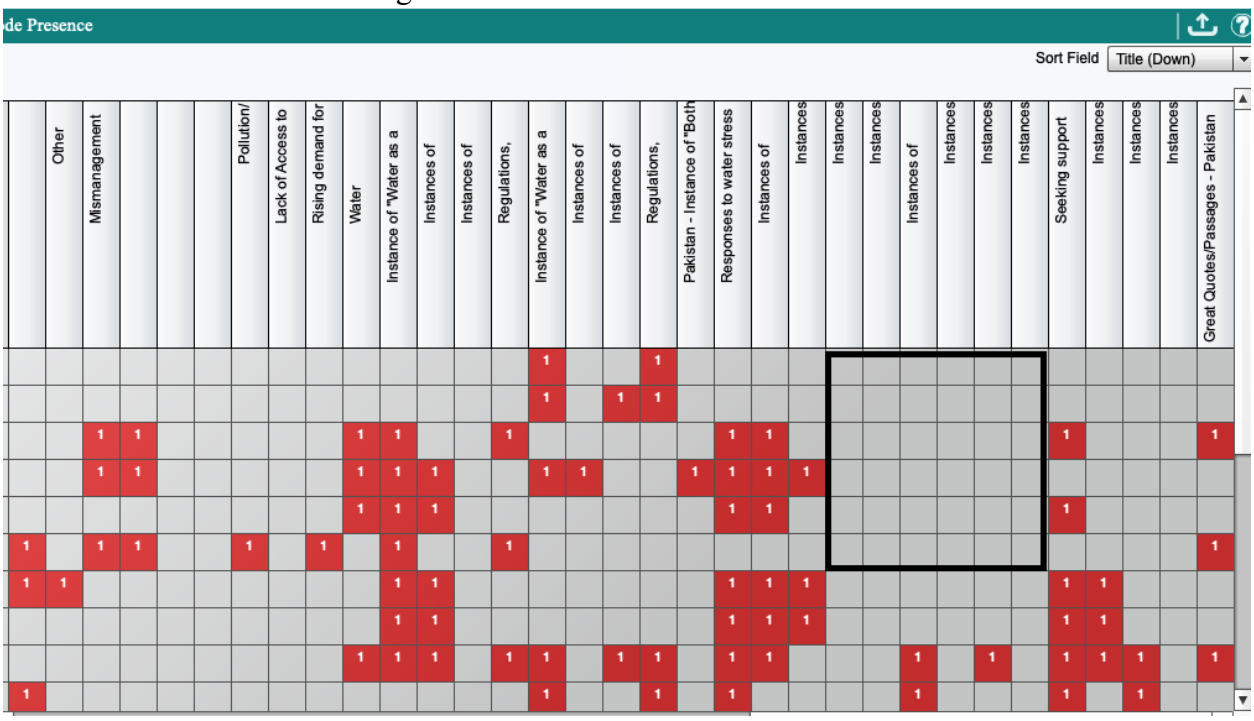
This is another section of the same Code Occurrence chart represented in Figure 3, where a '1' means that a code is present, and a blank square means that a code is not present. The black rectangle illustrates where primary documents from India, Pakistan, and/or an outside actor addressed Indus river policy that *did not* include any mention of conflict/competition nor cooperation with the upper or lower riparian state (India → Pakistan or Pakistan → India). Figures 3-6 refer to Key Finding #2 on page 22.

Figure 5 - India/Pakistan Code Presence



Source: Dedoose

Figure 6 - India/Pakistan Code Presence



Source: Dedoose

This is another section of the same Code Occurrence chart represented in Figure 3, where a '1' means that a code is present, and a blank square means that a code is not present. The black

square illustrates where primary documents from India, Pakistan, and/or an outside stakeholder addressed India or Pakistan's responses to perceived water stress in bilateral or multilateral forums and *did not* include any mention of the upper/lower riparian (India → Pakistan or Pakistan → India).

Appendix III

This appendix contains the code tree I created in Dedoose to apply in the analysis of my primary data sample. The numbers beside each code are the total number of applications for each, inclusive of all child code counts.

Figure 7
India Code Tree – Part 1

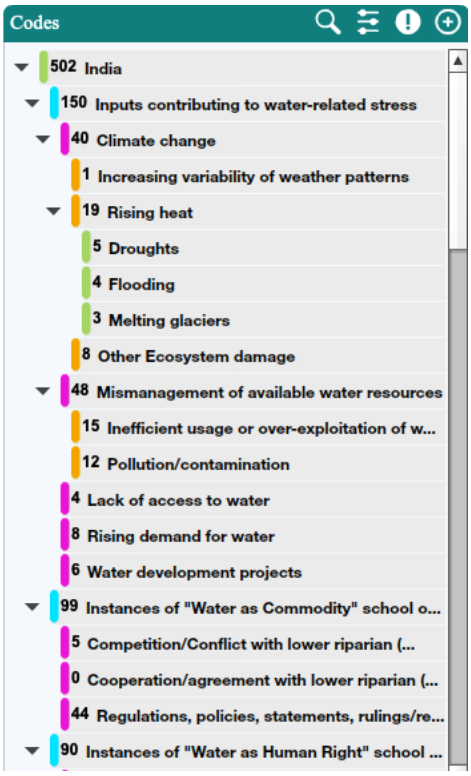


Figure 8
India Code Tree (continued)

Figure 9
End of India Code Tree/Start of Pakistan Code Tree

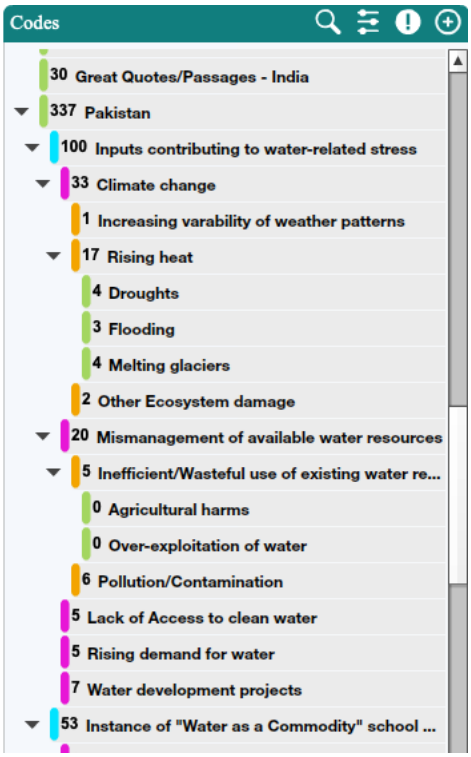
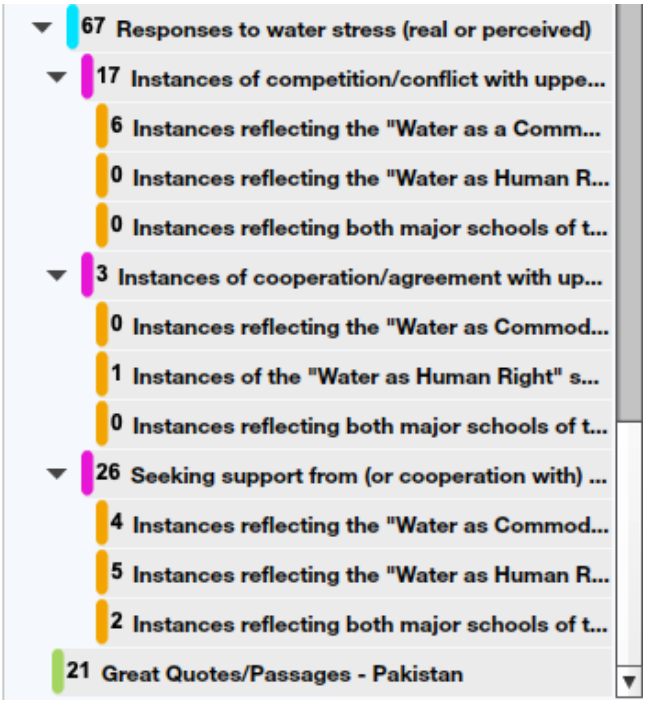


Figure 10
Pakistan Code Tree (continued)

Figure 11
End of Pakistan Code Tree



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PROFESSIONAL EXPERIENCE

PROJECT COORDINATOR, GLOBAL ECONOMY AND DEVELOPMENT
The Brookings Institution March 2020 – November 2020

- Provided project support to the Center for Universal Education; served as point of contact for external stakeholders and participants in Echidna Global Scholar visitor exchange program; assessed potential speaker candidates and drafted invitations for upcoming public events.
- Contributed to CUE's research by conducting literature reviews in support of ongoing programs. Supported publications via proofreading, copyediting and fact-checking.
- Scheduled 60+ onboarding meetings for incoming Vice President and Director of Administration for Global Economy and Development Program. Managed and scheduled weekly meetings, annual performance reviews, etc.
- Supported recruitment pipelines of senior staff and interns for the Global program; reviewed incoming applications, evaluated candidate qualifications, scheduled and conducted virtual interviews, coordinated post-interview assessments, performed reference checks, assembled onboarding materials for new hires.

PROJECT ASSOCIATE, MEDIA AND CONGRESSIONAL RELATIONS
The National Bureau of Asian Research (NBR) - Washington, DC May 2019 – August 2019

- Assisted Office Director in planning and execution of public interactions with Congressional staff and media such as large conferences, interviews, podcast production, and small briefing events.
- Processed contractor agreements and payments using SharePoint while maintaining SharePoint database of public contacts.
- Provided on-site logistical support at the 2019 Asia Policy Assembly including YouTube live-streaming, live social media engagement, and event photography.
- Crafted 25-30 weekly tweets for NBR's social media presence on Facebook, LinkedIn, and Twitter. Managed live social media coverage of public events. Recorded and tracked interaction data, and provided monthly reports to senior leadership.
- Performed open-source research in support of all NBR departments to promote timely Asia policy information, including preparing commentaries and briefing materials for scholars ahead of public engagements.

LEAD HOST
Crumbs and Whiskers – Washington, DC September 2017 – April 2019

- Conducted 25-30 daily health exams as part of providing for cat physical and mental health needs.
- Communicated mission and impact data to 100+ guests each day, 3-5 days each week.
- Supervised Store Hosts during regular business operations. Assisted in onboarding and training of new hires.

PRODUCER
TV Tokyo America, Inc - Washington, DC March 2012 – November 2014

- Attended 7-10 Congressional hearings, government briefings, and/or think-tank events each week. Synthesized content of events into oral briefings for Bureau Chief and visiting reporters on special assignments from Tokyo HQ.
- Provided consecutive interpretation during 100+ interviews and stakeouts with political VIPs.
- Responsible for producing one feature story per month for Japanese viewers. Initiated, arranged, and executed all stages of feature production including initial recruiting of experts, travel logistics, interview translation and transcription, and selection of soundbites for satellite broadcast.
- Gathered, analyzed, and transmitted breaking political and economic news to viewers in Japan.

PROJECT ASSOCIATE
Japan External Trade Organization – Annapolis, MD June 2010 – June 2011

- Traveled to 2-3 monthly trade shows to promote the advantages of doing business in Kanagawa, Japan. Arranged lodging and transportation logistics for each trip while remaining within budgetary constraints.
- Conducted due diligence and background research to identify 50+ prospective companies for recruitment per trade show. Created profiles of promising candidates and provided bilingual briefings to my Japanese superiors.
- Managed and created post-exhibition reports and maintained contact database of selected companies for follow-up.

CONGRESSIONAL AFFAIRS ASSISTANT
Embassy of Japan – Washington, DC July 2009 – June 2010

- Assisted with planning and execution of Embassy social functions. Assembled guest lists, sent invitations, and processed RSVP information for 75-100 person receptions.
- Arranged 35-40 weekly appointments for 7 Embassy diplomats and visiting Japanese officials to meet with policymakers and senior staff across Capitol Hill.
- Managed and updated Congressional Affairs collective contact database for Embassy diplomats and Minister of Congressional Affairs.

JAPAN BOWL ASSISTANT
The Japan-America Society - Washington DC January 2009 – April 2009

- Evaluated and prepared over 300 bilingual PowerPoint trivia questions on Japanese history, film, reading and writing, kanji, and grammar for high school students participating in the Japan Bowl, a nationally recognized scholastic competition for students of Japanese language.
- Compiled, catalogued, and tracked registration data of 150 student attendees nationwide and their accompanying teachers, chaperones, and parents using Filemaker Pro. Assisted in processing registration payments.
- Coordinated lodging, transportation, and dining needs of all Japan Bowl attendees to and from event venue.
- Managed the tasks of 3-5 bilingual volunteer staff assisting in preparing Japan Bowl quiz materials.

ASSISTANT LANGUAGE TEACHER
The Japan Exchange and Teaching Program (JET) - Chiba-ken, Japan July 2007 – July 2008

- Created and executed 10-15 English language classes each week, for eight grades across four separate Japanese Elementary Schools, one Japanese Middle School, and two separate night classes for adults.
- Acted as a cultural ambassador outside the classroom by engaging students in dialogue on current events, pop culture, international affairs, etc.
- Facilitated cultural exchange with 2 groups of visiting German exchange students, including providing bilingual tours to local temples and other historical sites.
- Privately coached 4 students in preparation for the 2007 national English speech contest.

KNOWLEDGE AND SKILLS

LANGUAGE:

- English: Native fluency
- Japanese: Fluent in Standard, Advanced, and Honorific Conversation; Skilled bilingual typing.

COMPUTER:

- Macintosh and Windows systems: Experienced in the use of Microsoft Office software (Word, Excel, Teams, PowerPoint, and Outlook), SharePoint, Salesforce, Dedoose, Final Cut Pro (a video editor), Adobe Photoshop, Adobe Acrobat, Audacity (an audio editor), Zoom, and BlueJeans.
- Adept user of social media platforms such as Facebook, Twitter, and Instagram. Proficient with social media support platforms Bitly, Hootsuite, and Google Analytics.

EDUCATION

The Johns Hopkins University, Krieger School of Arts & Sciences, Washington DC

- Master of Arts: Global Security Studies (Class of spring, 2021) September 2018 – Present
  - *Concentration in Energy and Environmental Security*

Dickinson College, PA September 2003 – May 2007

- Bachelor of Arts: East Asian Studies

Antioch College, OH September 2005 – December 2005

- Antioch Education Abroad – Buddhist Studies Program – Kansai, Japan